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**U.S. DEPARTMENT OF ENERGY
OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT
OFFICE OF QUALITY ASSURANCE**

**AUDIT REPORT
OF
LAWRENCE LIVERMORE NATIONAL LABORATORY
LIVERMORE, CALIFORNIA**

AUDIT LLNL-ARC-98-11

APRIL 20 – 24, 1998

Prepared by: _____ **Date:** _____

**Kristi A. Hodges
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Office of Quality Assurance**

Approved by: _____ **Date:** _____

**Donald G. Horton
Director
Office of Quality Assurance**

1.0 EXECUTIVE SUMMARY

As a result of Quality Assurance (QA) Audit LLNL-ARC-98-11, the audit team determined that the Lawrence Livermore National Laboratory (LLNL) is marginally effective in implementing the Office of Civilian Radioactive Waste Management (OCRWM) QA Program in accordance with the U.S. Department of Energy (DOE) OCRWM Quality Assurance Requirements and Description (QARD) document, DOE/RW-0333P, Revision 7; and LLNL's implementing procedures.

QA Program Elements 1.0, 5.0, 6.0, 17.0, and Supplement II were considered effective with Elements 2.0, 12.0, 16.0, and Supplement III determined to be marginally effective. Elements 4.0, 7.0, and Supplement I were not effectively implemented. Implementation of Supplement V was considered indeterminate. There was no implementation of Element 15.0, and currently no LLNL activities implement Elements 3.0, 8.0, 9.0, 10.0, 11.0, 13.0, 14.0, 18.0 and Supplement IV.

Due to the deficiencies identified in areas of work planning, document review, procurement, Measuring and Test Equipment (M&TE), software qualification, and scientific notebooks (SN), there is concern that deliverables and data submitted to the technical database may be adversely affected. Evaluation of individual technical products will be conducted during performance based audits.

The audit team identified deficiencies during the audit that resulted in the issuance of nine OCRWM Deficiency Reports (DR) described in Section 5.5.1. There were two deficiencies identified by the audit team and corrected prior to the post-audit meeting. These conditions are described in Section 5.5.2 of this report. Additionally, there are 13 recommendations resulting from the audit, which are detailed in Section 6.0 of this report.

2.0 SCOPE

The audit was conducted to evaluate the adequacy, compliance, and effectiveness of implementation of the OCRWM QA Program at LLNL.

The following QA program elements/requirements were evaluated during the audit, in accordance with the approved audit plan:

QA PROGRAM ELEMENTS/REQUIREMENTS

1.0	Organization
2.0	Quality Assurance Program
4.0	Procurement Document Control
5.0	Implementing Documents
6.0	Document Control
7.0	Control of Purchased Items and Services

12.0	Control of Measuring and Test Equipment
15.0	Nonconformances
16.0	Corrective Action
17.0	Quality Assurance Records
Supplement I	Software
Supplement II	Sample Control
Supplement III	Scientific Investigation
Supplement V	Control of the Electronic Management of Data
Appendix C	Mined Geologic Disposal System (amplification of QARD Sections 4.0, 7.0 and 15.0)

The following QA program elements were not reviewed during the audit since LLNL currently has no activities to which these elements apply:

3.0	Design Control
8.0	Identification and Control of Items
9.0	Control of Special Processes
10.0	Inspection
11.0	Test Control
13.0	Handling, Storage, and Shipping
14.0	Inspection, Test and Operating Status
18.0	Audits
Supplement IV	Field Surveying
Appendix A	High-Level Waste Form Production
Appendix B	Storage and Transportation

3.0 AUDIT TEAM AND OBSERVERS

The following is a list of audit team members and their assigned areas of responsibility:

<u>Name/Title/Organization</u>	<u>QA Program Elements/Requirements</u>
Kristi A. Hodges, Audit Team Leader	1.0, 2.0, 5.0, and 6.0
Donald J. Harris, Auditor	Supplement II and III
Stephen D. Harris, Auditor	2.0, 15.0, 16.0, Supplement I and V, and Appendix C
Emily S. Reiter, Auditor	4.0, 7.0, 12.0, 17.0, and Appendix C

4.0 AUDIT MEETINGS AND PERSONNEL CONTACTED

The pre-audit meeting was held on April 20, 1998, at the LLNL offices located in Livermore, California. Daily debriefing and coordination meetings were held with LLNL's management and staff, and daily audit team meetings were held to discuss audit status. The audit concluded with a post-audit meeting held on April 24, 1998, at the

LLNL offices in Livermore, California. Personnel contacted during the audit are listed in Attachment 1. The list includes those who attended the pre-audit and post-audit meetings.

5.0 SUMMARY OF AUDIT RESULTS

5.1 Program Effectiveness

The audit team concluded that, overall, the QA program implemented at LLNL is marginally effective for the scope of this audit with the following exceptions: QA Program Elements 4.0, 7.0, and Supplement I were considered unsatisfactory.

Elements 4.0 and 7.0 were determined unsatisfactory based procurement-related deficiencies that are identified in Corrective Action Request (CAR) VAMO-98-C-005, which was issued prior to the audit. Additional procurement-related deficiencies associated with Fiscal Year (FY) 1998 procurements were identified and documented during the audit, indicating that remedial actions had not been implemented in response to the CAR. Supplement I was determined unsatisfactory based on software qualification deficiencies that are identified in CAR LVMO-98-C-006 and DR LLNL-98-D-065, which were also issued prior to the audit. No additional deficiencies related to Supplement I were identified during the audit. No additional deficiencies related to Supplement I were identified during the audit.

Element 2.0 was determined to be marginally effective based on identified deficiencies associated with work planning and the review of procedures, plans, and technical documents. Element 12.0 was determined to be overall marginally effective, in that M&TE located and used in laboratories that support some activities were effectively controlled; whereas M&TE located and used in laboratories that support other activities failed to meet minimum QARD requirements. Likewise, overall implementation of Supplement III requirements was determined to be marginally effective based on effective QARD implementation in some activities but failure to meet minimum QARD requirements in others. DRs were generated in these marginally effective areas which document deficient conditions in work planning, document review, M&TE, and SNs.

Although there is no related deficiency document, Element 16.0 was determined to be marginally effective. This was based on an evaluation of FY 97 LLNL deficiency document responses and resolutions. Improvements are needed; however the Civilian Radioactive Waste Management System Management and Operating Contractor (CRWMS M&O) has agreed to implement measures to ensure that committed corrective actions are completed on time and with

appropriate documentation. The Office of Quality Assurance (OQA) will monitor the progress to ensure that these measures are effective to improve LLNL corrective actions.

DRs were generated for failure to meet the requirements of Administrative Procedure (AP)-17.1Q, Revision 0, "Record Source Responsibilities for Inclusionary Records"; however, overall implementation of QARD Element 17.0 was determined effective.

LLNL issued its procedure to meet Supplement V requirements in February 1998, but there was minimal implementation by which to assess its effectiveness. OQA will schedule a future surveillance to ensure procedure implementation and effectiveness.

A review of literature regarding thermodynamic data for nickel and zirconium for inclusion in the Yucca Mountain Site Characterization Project (YMP) chemical database, GEMBOCHS was discussed during the audit. The review was identified by LLNL personnel as a peer review; however, the Summary Account Statement of Work (Milestone SPL4DM4) did not identify it as such. In addition, a preliminary evaluation of the available documentation questioned the appropriateness of the peer review designation and the implementation of the LLNL peer review procedure. It was determined that follow-up is necessary to adequately assess the activity, which will be scheduled as an OQA surveillance.

Areas that warrant positive recognition include the Long Term Corrosion Facility, control of LLNL SNs, controlled document server (on-line procedures), procurement requisition processing, and the retrieval of records/documents during the audit. Overall, LLNL employees and management were professional, cooperative, and knowledgeable of their work activities.

The results for each program element evaluated are contained in Attachment 2, Summary of Audit Results.

5.2 Stop Work or Immediate Corrective Actions Taken

There were no Stop Work Orders, immediate corrective actions, or related additional items resulting from this audit.

5.3 QA Program Audit Activities

A summary table of audit results is provided in Attachment 2. The details of the audit evaluation, along with the objective evidence reviewed, are contained within the audit checklists. The checklists are kept and maintained as QA Records.

5.4 Technical Audit Activities

There were no technical audit activities evaluated during this audit.

5.5 Summary of Deficiencies

The audit team identified eleven deficient conditions during the audit, which resulted in issuance of nine DRs. Additional deficiencies were identified and corrected prior to the post-audit meeting.

Synopses of deficiencies documented as DRs, and those corrected during the audit, are detailed below. The DRs have been transmitted under a separate letter.

5.5.1 Deficiency Reports

DR LLNL-98-D-086

LLNL procedures 033-YMP-QP 2.1, Revision 7, "Preparation, Approval and Revision of Procedures, Requirements, and Plans"; and 033-YMP-QP 3.3, Revision 4, "Review of Technical Publications," are not adequate to assure appropriate reviews and/or documentation of reviews for LLNL procedures, plans, and technical documents. Procedure-related deficiencies include: inadequate documentation and resolution of mandatory comments; failure to provide definitions of major and minor comments or revisions; the option rather than requirement to review the next document/procedure draft, although significant changes might have occurred as a result of the review process; indication of minor (editorial comments) that were not editorial in nature; inconsistent usage of forms; and unclear identification of records.

DR LLNL-98-D-087

The LLNL formal review process has not been implemented for technical documents that are identified as Level 4 Milestone Reports. Only technical reports generated by LLNL that will be issued by the CRWMS M&O as Level 3 Milestone Reports have been subject to an internal review by LLNL. QARD Sections III.24B and 2.2.10 apply to all technical reports that support activities designated as quality affecting and do not differentiate between levels of documents.

DR LLNL-98-D-088

AP-17.1Q requires document sources to generate and submit lists of references cited in scientific and technical reports to the Technical Information Center (TIC) and to the Records Processing Center (RPC).

LLNL has not generated lists of cited references for its Level 4 Milestone Reports, with the exception of Level 4 deliverables that will be subsequently issued by the CRWMS M&O as Level 3 Milestone Reports. Therefore, the TIC and RPC have not received lists of cited references for the majority of LLNL-generated technical documents.

DR LLNL-98-D-089

LLNL procedure 033-YMP-QP 5.0, Revision 4, "Technical Implementing Procedures," requires manufacturer's manuals or other operating manuals to be included in or attached to Technical Implementing Procedures (TIP) if applicable to operation of specific instruments and M&TE. Instances of use of operating/manufacturer's manuals that were not appended to or included in TIPs were identified and documented in this DR.

DR LLNL-98-D-090

Records-related deficiencies were documented and include the following:

Indexing information; i.e., title, date, author's name/organization, QA designator, identifier, and traceability designator were not indicated on each QA record as required by AP-17.1Q.

AP-17.1Q requirements for submittal of electronic media; e.g., submittal of two copies, and information that is to be indicated on external labels or associated documentation, were not implemented in the submittal of floppy and compact disks.

Information that was indicated in a procurement package as required for acceptance of the service was omitted from the submitted record package.

DR LLNL-98-D-091

M&TE-related deficiencies were documented and include the following:

Instruments (pipettes, ovens, balances, and pH meters) were not labeled, tagged or suitably marked to indicate calibration status.

A Nonconformance Report (NCR) was not initiated for a digital pipette that was stated as "out-of-service." Furthermore, it was not tagged or labeled and was co-mingled with other pipettes that are used for LLNL-YMP work. In addition, an NCR was not initiated when a balance was found to be "out-of-tolerance."

A Certificate of Calibration did not include the revision number of the procedure used to perform the calibration.

DR LLNL-98-D-092

Procurement-related deficiencies for FY 1998 procurements were documented and include the following:

A subcontract was awarded to Montana State University without indicating that the QARD applies and without qualification for inclusion on the OCRWM Qualified Suppliers List (QSL).

Purchase Requisitions were inappropriately processed as Non-Q services for USAE Waterways (analytical services, WBS 1.2.3.12), Sequoia Analytical (mineral analysis, WBS 1.2.3.12), Purdue University (analytical service, WBS 1.2.2.5), and Washington State University (Thermal Dynamic Data Task, WBS 1.2.3.10).

Calibration services were provided by Vaisala, although this supplier is listed on the QSL with a restriction that work cannot be performed by the supplier until OQA performs a supplier survey. The survey had not been performed at the time of the calibration.

Calibration services were provided by the LLNL Analytical Science Division without qualification for inclusion on the QSL.

DR LLNL-98-D-093

SN-related deficiencies were documented and include the following:

Reviewed SNs failed to identify the equipment to be used, calibration requirements, accuracy, precision and/or justification for not requiring calibration.

Results of user-calibrations were not recorded in the SN.

Results of pH measurements were recorded without identification of the pH meter.

Sample analysis results from the LLNL Analytical Service Division (non-LLNL-YMP) were not controlled by TIPs or SNs.

Incomplete/undated SN entries.

DR LLNL-98-D-094

Work planning deficiencies were documented and include the following:

A review of LLNL Activity Plans E-20-60, "Microbiologically Influenced Corrosion"; and MM-01, "Determination of Microbiological Impacts on Potential Yucca Mountain Repository," identified that work planning requirements of LLNL procedure 033-YMP-QP 2.1 and QARD 2.2.5 were not adequately implemented.

Activities that supported Activity Plan MM-01 were designated as preliminary or scoping, therefore, the OQCRM QARD was not applied. This designation was incorrect and in conflict with the Project Planning Sheet and the Summary Statement of Work, which indicate that the OCRWM QARD applies. In addition, the published LLNL report (Milestone SPLGEM4) states that it was generated under the OCRWM QARD, although the OCRWM QARD had not been applied to the activities reported therein.

CRWMS M&O and LLNL suppliers of services did not generate required supplements to LLNL Activity Plan E-20-60. The Activity Plan requires the University of Nevada, Las Vegas to prepare a supplemental plan, but the contract was issued by the CRWMS M&O without addressing its preparation. Therefore, UNLV was not aware of its responsibility and did not prepare the required plan. In addition, the Statement of Work for LLNL's subcontract with Montana State University requires the university to provide a plan that details the work to be accomplished; however, the required plan was not prepared or provided.

Activity Plans did not identify software, laboratory equipment, M&TE or procedures to be used.

5.5.2 Deficiencies Corrected During the Audit

Deficiencies considered isolated in nature and only requiring remedial action can be corrected during the audit. The following deficiencies were identified and corrected during the audit:

1. LLNL procedure 033-YMP-QP 2.9, Revision 6, "Indoctrination and Training," did not establish a system that provides evidence that training occurred prior to performing quality affecting work. The procedure also did not address the actions required when personnel are trained after the issuance of a procedure revision or Change Notice (CN). The effective date of a procedure/CN, training assignment date, and employee completion date were documented; however, if the completion date was indicated after the effective date, there was no documented evidence that work had not been performed, work was not impacted, or work was impacted requiring initiation of a deficiency document. A CN was issued during the audit which clarified that

required training for each new employee will be completed before they are assigned quality affecting work tasks. In addition, the CN established the documentation and impact analysis required when personnel have not been trained prior to a procedure effective date. DR LLNL-98-D-026, issued prior to the audit, documents that three new LLNL employees were not identified as requiring training prior to performance of work subject to the QARD. This CN should support corrective action to preclude recurrence of that documented deficiency.

2. Based on a review of LLNL training files and matrices, two employees had not completed read-only training assignments prior to procedure effective dates. The training assignments (one involving a QP and the other involving TIPs) were completed during the audit and were verified to be isolated with no evidence that associated work activities had been performed prior to documenting the training.

5.5.3 Follow-up of Previously Identified CARs and DRs

An evaluation of LLNL procurement-related deficiencies documented in CAR VAMO-98-C-005 concluded that remedial corrective actions had not been performed. At the time of the audit, the CRWMS M&O had not submitted an acceptable response; therefore a course of action had not been established. Additional deficiencies related to FY 1998 LLNL procurements were identified and documented in DR LLNL-98-D-092. Of significance is that LLNL has taken a positive step to ensure that future procurements meet QARD requirements. LLNL procedure 033-YMP-QP-4.0, Revision 6, CN 4.0-6-3, "Procurement Document Control," was issued during the audit. The revision will ensure that the onsite OQA representative reviews and concurs with the quality designation and content of all future LLNL procurement documents. This action is perceived as necessary to minimize future deficiencies while proceeding with corrective action for existing deficiencies.

Follow-up of DR LLNL-98-D-025 resulted in the determination that the DR should be closed and its remaining issues transferred to DR LLNL-98-D-094, which provides greater detail and focus on work planning requirements.

6.0 RECOMMENDATIONS

The following recommendations resulted from the audit and are presented for consideration by LLNL's management:

1. It is not apparent, based on review documentation, which organization or discipline a designated reviewer is representing, therefore, it is difficult to determine whether all organizations affected by a document were given an opportunity to participate in the review process. It is recommended that LLNL reviewers clearly identify the organization or discipline that they are representing.
2. LLNL procedure 033-YMP-QP 5.0, Revision 4, "Technical Implementing Procedures," states that a higher level of management above the individual performing the work ensures that work is proceeding in accordance with the TIP, work is stopped when necessary, data collected meet TIP objectives, documentation represents a traceable path, etc. With LLNL's increased work scope and the types of deficiencies identified during this audit, LLNL management must take positive steps to ensure adequate oversight of activities. This oversight may include OQA assistance via the onsite representative or scheduled surveillances, but emphasis must be placed on LLNL's responsibility for ensuring that deficient conditions are identified and corrected before work activities are impacted.
3. Based on review of controlled LLNL documents, there are several documents and document types that are no longer in use. It is recommended that an effort be undertaken to rescind all LLNL documents that are no longer in use. The effort should include verification that the document can be retrieved in the Records Information System.
4. LLNL procedure 033-YMP-QP 3.3 addresses the review of technical documents, but there is no procedure that addresses the preparation of technical documents. YAP-5.8Q, Revision 1, "Technical Document Preparation," became effective on April 23, 1998, which was during the audit. The procedure applies to the Yucca Mountain Site Characterization Office (YMSCO) and affected organizations and states that an alternate procedure may be used if it incorporates the procedure requirements, particularly those of Paragraph 5.2.2b.17. LLNL evaluated endorsing the procedure during the audit and determined that it was written for YMSCO and could not be directly endorsed by LLNL. Therefore, a recommendation was made during the audit for LLNL to incorporate the YMP Administrative Procedure (YAP) requirements into 033-YMP-QP 3.3. Note that there is no QARD requirement that establishes criteria for the preparation of technical documents, only a requirement for review in accordance with QARD 2.2.10.
5. The QARD, Appendix C.2.5, requires nonconforming products to be documented, evaluated, identified, segregated, and dispositioned in accordance with Section 15.0, "Nonconformances." It is recommended that deficiency documents that were open during and generated as a result

of this audit be evaluated to determine if LLNL products have been impacted and therefore require generation of NCRs in accordance with YAP 15.1Q, "Control of Nonconformances."

6. In order to preclude items and services from being procured from unapproved suppliers, LLNL personnel involved in the procurement process need access to the OCRWM QSL. The QSL is currently on the Project VAX system and an account is required for access. If VAX capability at LLNL is not possible, arrangements should be made for periodic transmittals of the QSL to LLNL; however, this request should be initiated by LLNL.
7. LLNL procedure 033-YMP-QP 7.0, Revision 2, "Control of Purchased Items and Services," Paragraph 4.0.5.3, should be revised to read, "The ICO Procurement is initiated by completing a Determination to use an Integrated Contractor ICO Form." The form is currently used in lieu of a memorandum that is required per the procedure, and it contains the same information that is required in a memorandum; however, the form is not recognized in the procedure.
8. LLNL procedure 033-YMP-QP 2.5, "Acceptance of Data Not Generated Under the Control of the QARD," should be deleted. YAP-SIII.1Q, "Qualification of Unqualified Data," designates the YMSCO Assistant Manager of Licensing as responsible for determination of data that may need to be qualified and the methods for qualification; e.g., technical assessment or peer review.
9. LLNL procedure 033-YMP-QP 3.0, "Scientific Investigation Control," should be revised to eliminate processes that are no longer being utilized at LLNL; e.g., Scientific Investigation Plans and Study Plans. In addition, 033-YMP-QP-2.1 should identify Test Plans, which are indicated in 033-YMP-QP 3.0 as support plans to Activity Plans.
10. LLNL Procedure 033-YMP-QP 4.0, Paragraph 4.0.2, needs to include: 1) LLNL Internal Acquisition, which is lightly touched upon in Paragraph 4.0.5; and 2) Intra-University Transfer Authorizations (refer to Summary Account Statement of Work TR3C5FBB, University of California, Davis). In addition, Paragraph 4.0.5.1 – 1.C.4 should clarify that suppliers that are to use the CRWMS M&O and/or LLNL-YMP's QA Program are to be qualified and placed on the OCRWM QSL, where direct LLNL supervision is not provided and different processes, methodologies or equipment are being utilized.

11. LLNL Procedure 033-YMP-QP 3.5, "Control of Internal Technical Interfaces," addresses internal technical/scientific information interfaces and includes transmittal of data and models to the Performance Analysis Technical Area, and transmittals between Technical Areas. There has been no apparent implementation of this procedure, but interface control and transmittal of preliminary data is also addressed in 033-YMP-QP 3.6, "Collection, Review and Submittal of Technical Data," which has been implemented. It is recommended that 033-YMP-QP 3.5 be cancelled and its viable content incorporated into 033-YMP-QP 3.6, Paragraph 3.6.4.2.1 "Preliminary Data."
12. LLNL procedure 033-YMP-QP 8.0, "Identification and Control of Items, Samples and Data," Paragraph 8.0.4.3.3, requires, "Where data are the results of the efforts of more than one organization, TIPs describing the organizational responsibilities for that data are developed and implemented." There are no TIPs on the Master List of Procedures that address this activity; however, between the SNs, Activity Plans, and Test Plans, it appears that this requirement is satisfied. It is recommended that this paragraph be deleted and subsequently added to 033-YMP-QP 2.1.
13. AP-16.3Q, "Trend Reporting," is endorsed via LLNL 033-YMP-QP 16.2, "Trend Analysis." LLNL needs to delete 033-YMP-QP 16.2 (AP-16.3Q), since it has no responsibility for trend reporting. However, AP-16.4, "Root Cause," is applicable to LLNL and needs to be endorsed. In addition, LLNL procedures 033-YMP-QP 16.1, "Processing of Externally Originated Corrective Action Documents"; and 033-YMP-QP 18.1, "Surveillances," are not necessary, not implemented and should be cancelled.

7.0 LIST OF ATTACHMENTS

Attachment 1: Personnel Contacted During the Audit
Attachment 2: Summary Table of Audit Results

ATTACHMENT 1

Personnel Contacted During the Audit

<u>Name</u>	<u>Organization/Title</u>	<u>Preaudit Meeting</u>	<u>Contacted During Audit</u>	<u>Postaudit Meeting</u>
B Alegre	LLNL/Records Coordinator		X	
V. Bell	LLNL/Project Control Manager	X	X	
J. Blink	LLNL/Lab Lead *	X	X	X
B. Bryan	LLNL/Project Administrator	X	X	X
C. Chen	LLNL/PI		X	
J. Estill	LLNL/Senior Technologist		X	
J. Farmer	LLNL/TAL *	X	X	X
M. Fernandez	LLNL/TAL *	X	X	X
J. Horne	LLNL/Research Scientist		X	
W. Linn	LLNL/TAL *		X	X
J. McCreary	LLNL/Procurement Coordinator		X	
J. McCright	LLNL/Lead PI		X	
A. Meike	LLNL/Lead PI		X	
R. Monks	LLNL/EA	X	X	X
C. Palmer	LLNL/Deputy Lab Lead *	X	X	X
J. Palmer	LLNL/Publications Manager		X	
J. Pelletier	OQA/LLNL Site Representative	X	X	X
J. Podobnik	LLNL/Business Manager *	X		X
P. Stanworth	LLNL/Training Coordinator		X	
W. Weddermann	LLNL/Administrative Specialist	X	X	X
D. Wilder	LLNL/Principal Deputy Lab Lead *		X	X
A. Wilson	LLNL/Accounting Clerk		X	
J. Ziemba	OQA/LBNL Site Representative	X	X	X

LEGEND:

EA Engineering Assurance

LLNL Lawrence Livermore National Laboratory

PI Principle Investigator

OQA Office of Quality Assurance

TAL Technical Area Leader

* Indicates that the position has not been finalized and is noted as "Acting."

ATTACHMENT 2
Summary of Audit Results
For Procedural Compliance Evaluations

ELEMENT	IMPLEMENTING DOCUMENTS	DETAILS (Checklist)	DEFICIENCIES	RECOMMENDATIONS	PROGRAM ADEQUACY	PROCEDURE COMPLIANCE	OVERALL
1	033-YMP-QP 1.0, R.6	Pgs. 1, 2	N	N	SAT	SAT	SAT
2	033-YMP-QP 2.0, R.2, CN 2-4	Pg. 3	N	N	SAT	SAT	MARGINAL
	033-YMP-QP 2.1, R.7, CN 7-2	Pgs. 4-9	LLNL-98-D-086 LLNL-98-D-094	REC 1	UNSAT	UNSAT	
	033-YMP-QP 2.2, R.1, CN 1-2	Pgs. 10, 11	N	N	INDET	INDET	
	033-YMP-QP 2.4, R.1, CN 1-1	Pgs. 12-14	N	N	NI	NI	
	033-YMP-QP 2.6, R.2, CN 2-4	Pgs. 15-18	N	N	NI	NI	
	033-YMP-QP 2.9, R.6, CN 6-1	Pgs. 23-27	CDA 1, 2	N	SAT	SAT	
	033-YMP-QP 2.10, R.5, CN 5-3	Pgs. 28-30	N	N	SAT	SAT	
	033-YMP-QP 3.3, R.4, CN 4-5	Pgs. 19-22	LLNL-98-D-086 LLNL-98-D-087	REC 1, 4	UNSAT	UNSAT	
	033-YMP-QP 18.1, R.5, CN 5-3	Pg. 88	N	REC 13	N/A	N/A	
4	033-YMP-QP 4.0, R.6, CN 6-2	Pgs. 31-37	VAMO-98-C-005* LLNL-98-D-090 LLNL-98-D-092 LLNL-98-D-094	REC 10	SAT	UNSAT	UNSAT

ELEMENT	IMPLEMENTING DOCUMENTS	DETAILS (Checklist)	DEFICIENCIES	RECOMMENDATIONS	PROGRAM ADEQUACY	PROCEDURE COMPLIANCE	OVERALL
5	033-YMP-QP 5.0, R.4, CN 4-2	Pgs. 38-40	LLNL-98-D-089	REC 2	SAT	MARGINAL	SAT
	YAP-5.8Q, R.2,	Pg. 41	N	REC 4	NI	NI	
6	033-YMP-QP 6.0, R.5, CN 5-3	Pgs. 42-48	N	REC 3	SAT	SAT	SAT
	AP-6.1Q, R.0	Pg. 49	N	N	NI	NI	
7	033-YMP-QP 7.0, R.2, CN 2-2	Pgs. 50-54	VAMO-98-C-005* LLNL-98-C-092	REC 7	SAT	UNSAT	UNSAT
	033-YMP-QP 13.0, R.7, CN 1-3	Pgs. 67-69	N	N	SAT	SAT	
	AP 7.4Q, R.2	Pgs. 55, 56	VAMO-98-C-005* LLNL-98-D-092	REC 6	SAT	SAT	
12	033-YMP-QP 12.0, R.7	Pgs. 57-66	LLNL-98-D-089 LLNL-98-D-091 LLNL-98-D-093	N	SAT	UNSAT	MARGINAL
15	YAP 15.1Q, R.3, ICN 1	Pgs. 70-73	N	REC 5	NI	NI	NI
16	AP 16.1Q, R.2	Pgs. 74, 75	N	N	SAT	MARGINAL	MARGINAL
	AP 16.2Q, R.2	Pg. 76	N	N	SAT	NI	
	AP 16.4Q, R.0	Pg. 78	N	N	SAT	NI	
	033-YMP-QP 16.1, R.3	Pgs. 79, 80	N	REC 13	NI	NI	
	033-YMP-QP 16.2, R.5 (Endorses AP-16.3Q)	Pg. 77	N	REC 13	N/A	N/A	

ELEMENT	IMPLEMENTING DOCUMENTS	DETAILS (Checklist)	DEFICIENCIES	RECOMMENDATIONS	PROGRAM ADEQUACY	PROCEDURE COMPLIANCE	OVERALL
17	AP 17.1Q, R.0	Pgs. 87-87	LLNL-98-D-088 LLNL-98-D-090	N	SAT	MARGINAL	SAT
SUPP. I	033-YMP-QP 3.2, R.4, CN 2-1	Pgs. 89-96	LVMO-98-C-006* LLNL-98-D-065*	N	UNSAT	UNSAT	UNSAT
SUPP. II	033-YMP-QP 8.0, R.2, CN 2-1	Pgs. 97-100	N	REC 12	SAT	SAT	SAT
SUPP. III	033-YMP-QP 2.5, R.1, CN 1-3	Pgs. 101-105	N	REC 8	NI	NI	MARGINAL
	033-YMP-QP 3.0, R.5, CN 5-1	Pgs. 106-111	LLNL-98-D-094	REC 9	UNSAT	UNSAT	
	033-YMP-QP 3.4, R.4, CN 4-2	Pgs. 112-118	LLNL-98-D-093	N	SAT	UNSAT	
	033-YMP-QP 3.5, R.1, CN 1-1	Pgs. 119, 120	N	REC 11	NI	NI	
	033-YMP-QP 3.6, R.0, CN 0-2	Pgs. 121-124	N	REC 11	SAT	SAT	
	YAP-SIII.3Q, R.2	Pg. 122	N	N	SAT	SAT	
SUPP. V	033-YMP-QP 3.8, R.0	Pgs. 125-127	N	N	INDET	NI	INDET

LEGEND:

CDA..... Corrected During Audit
N/A..... Not Applicable
N/I..... Not Implemented
N..... None

REC..... Recommendation
SAT..... Satisfactory
UNSAT..... Unsatisfactory
INDET..... Indeterminate

*CAR/DR was written and issued prior to the Audit.

